November 8, 2010

Water Docket, Environmental
Protection Agency, Mailcode: 28221T,
1200 Pennsylvania Ave., NW.,
Washington, DC 20460.

Re: Docket ID No. EPA–R03–
OW–2010–0736

Dear Agency Representative:

We have read the Draft Total Maximum Daily Load (TMDL) for the Chesapeake Bay dated September 24, 2010, attended the public meeting on October 19, 2010 at State College, PA, and offer our comments as follows:

1. The TMDL lists backstop allocations imposed by EPA because the jurisdictions WIP did not provide sufficient assurance that programs would be implemented to achieve the necessary pollution load reductions. The jurisdictions have until November 29, 2010 to re-submit a WIP that meets EPA criteria. Based on this, the final TMDL (due to be issued December 31, 2010) may or may not be the backstop values or values set by the WIP. Therefore, we think that it is counterproductive to expect the public to comment on a TMDL by November 8, 2010 that may or may not be the indicated backstop values. A time extension for comments should be granted to give the public opportunity to comments on the final TMDL.

2. The Chesapeake Bay TMDL Section 4.7.4 "On-site Wastewater Treatment Systems" states that "the on-site wastewater Treatment systems (OSWTS) represented an estimated 6 percent of the total nitrogen load from the Chesapeake watershed in 2009. Information on the watershed loads from OSWTs is generally sparse. Detailed descriptions of data procedures, source information and assumptions used in estimating these loads are in Palace et al. (1998)".
    a. In the referenced document (Palace, 1998), a total nitrogen concentration of about 39 mg/l is estimated at the edge of the septic field. This value is calculated using an average water flow of 75 gpd for septic tank, and a split of groundwater septic flow of 3,940 grams/person/year and surface flow of 4,240 grams/person/year. Then an assumption of a 60 percent reduction of total nitrogen is made between the edge of septic system field and the edge of river nitrate load. Given the assumption of 60 percent reduction of total nitrogen load, the total nitrogen load at the edge of river from OSWTS is calculated as 23

mg/l. These numbers are the base for the estimation of 6 percent of the total nitrogen load from OSWTS to Chesapeake watershed.

b. However, both the assumption of the 60 percent reduction and the calculation of the total nitrogen at the edge of river are problematic. First of all, even if we assume that the 60 percent reduction of total nitrogen between the edge of septic system field and the edge of river is correct, the total nitrogen at the edge of river should be 39 mg/l X (1-60%) = 15.6 mg/l, not 23 mg/l. Secondly, the assumption of a total attenuation of 60 percent lacks supporting evidence. Palace (1998) indicated that this number is primarily based on three sources: 1) nitrogen attenuation by soils - research conducted by Robertson and Cherry et al on 1991 and 1992; 2) uptake of N by plant – research conducted by Brown and Thomas in 1978 and 3) nitrogen attenuated in the primary through streams before reaching the main river. No reference on the third source, therefore it is not discussed here.

c. In the research conducted by Robertson et al, groundwater plumes in shallow, unconfined sand aquifers impacted by septic systems were monitored for nitrogen and other water quality parameters. Since the research was based on a soil type that has distinctly different hydro geologic characteristics compared to the majority of Pennsylvania soils, the conclusion, if any, should not be simply applied to Pennsylvania soil. In addition, the findings from the research did not support the assumption of 60 percent reduction. Some findings from the same research include: mobile plume solutes such as nitrate occurred at more than 50 percent of the source concentrations 130 m down-gradient from the septic tank; but almost complete nitrate attenuation was observed within the last 2 m of the plume flow path before discharge to the river.

d. Brown et al (1978) performed the research on the uptake of nitrogen from septic fields by grass. Grass uptake was equivalent to 9%, 32% and 46% of the nitrogen applied to the soils with percolation rates of 25.4, 3.8 and <0.3 cm/hour. The results indicated that the less permeable soils, the majority of Pennsylvania soils, the more nitrogen uptake from grass. The results also showed that nitrogen uptake decreased rapidly with distance from the septic line. At 60 cm from the edge of the septic line and beyond, the uptake of nitrogen by grass was essentially the same as from unfertilized native soil.

e. From both referenced research that Palace (1998) cited, we could not draw the conclusion that the reduction of nitrogen load from the edge of septic tank to the edge of river is approximately 60 percent. Therefore, the estimated 6 percent of the total nitrogen load from the Chesapeake watershed that based on this assumption is also problematic.

f. We agree with Section 10 of Pennsylvania's Watershed Implementation Plan:
    i. Aggregate onlot systems in the Chesapeake Bay watershed contributed relatively minor total nitrogen load both individually and collectively.
    ii. The cost/benefit of controlling onsite wastewater systems is not justifiable.
    iii. Section 10 states "The Commonwealth of Pennsylvania at this time will not be developing or implementing a strategy to ensure that onsite wastewater systems require denitrification solely to provide nutrient reduction for the nutrient loadings to the Chesapeake Bay".

3. The TMDL lists backstop allocations imposed by EPA on wastewater treatment plant (WWTP) point sources of annual total nitrogen (TN) of 3 mg/l and annual total phosphorus (TP) of 0.1 mg/l at design flows, will create an unjustified economic burden on the customers of these system. These proposed total nitrogen and total phosphorus effluent limits are at the limit of technology. The Pennsylvania Department of Environmental Protection (PA DEP) has already imposed National Pollutant Discharge Elimination System (NPDES) Permit Limits of annual total nitrogen (TN) of 6 mg/l and annual total phosphorus (TP) of 0.8 mg/l at design flows. Each of these Pennsylvania facilities would have already spent tens of millions of dollars to comply with the PA DEP imposed NPDES Permit Limits.
    a. The annual total nitrogen (TN) of 6 mg/l and annual total phosphorus (TP) of 0.8 mg/l at design flows can be achieved biologically in the activated sludge process through denitrification process and biological phosphorus uptake process. The activated sludge process is the common used process in Pennsylvania by WWTPs. The added benefit of the denitrification is the reduction of electrical energy consumption and net gain of alkalinity to the WWTP effluent. The reduction of electrical energy has a secondary impact of less air emissions from the electrical generating facility, which is generating electricity for the WWTP.
    b. The annual total nitrogen (TN) of 3 mg/l and annual total phosphorus (TP) of 0.1 mg/l at design flows cannot be achieved biologically in activated sludge processes. Additional processes, such denitrification filters will need to be added to the facilities to achieve the total nitrogen removal requirements; chemical precipitation and filtration will be required to be added to the facilities to achieve the total phosphorus removal requirements. These upgrades will costs tens of millions of dollars per facility. Many of these WWTP facilities will not have the hydraulic profiles for the effluent from their existing processes to gravity flow through these new processes, and hence will need to consume additional electrical energy to pump the water to these new processes. These

processes require chemicals; methanol or another carbon source for the denitrification processes, and coagulants (i.e. aluminum sulfate, ferric chloride) for the phosphorus removal. The manufacture of chemical will require the consumption of additional electrical energy. This consumption of additional electrical energy will create more air emissions which lead to more deposition of contaminants of the Chesapeake Bay. The coagulants used to precipitate phosphorus will be collected on these filters and generate chemical sludges that will need to be disposed.

We respectfully request the Agency consider these comments in formulating the Final Chesapeake Bay TMDL, and appreciate the opportunity to offer them.

Sincerely

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